

WHAT IS CLAIMED IS:

1. A bearing apparatus for a wheel of vehicle comprising:

an inner member (1) including a hub wheel (2, 21) having a wheel mounting flange (4) formed integrally therewith at one end thereof and a cylindrical portion (2b) axially extending from the wheel mounting flange (4), including an inner ring (3) fitted on the cylindrical portion (2b); an outer member (10) arranged around the inner member (1), and double row rolling elements (6, 6) contained freely rollably between the inner and outer members (1, 10), the inner ring (3) being secured in an axial direction relative to the hub wheel (2, 21) by a caulked portion (2c) formed by radially outwardly deforming the end of the cylindrical portion (2b) of the hub wheel (2, 21) characterized in that a chamfered outer circumferential surface (11) of the back side of the inner ring (3) is formed as a cut surface machined after its heat treatment.

2. A bearing apparatus for a wheel of vehicle of claim 1 wherein the hub wheel (2, 21) is directly formed on its outer circumferential surface with an inner raceway surface (2a) and its outer circumferential region from the base of the wheel mounting flange (4) to the cylindrical portion (2b) through the inner raceway surface (2a) is hardened by high frequency induction hardening as having the surface hardness of 54~64 HRC, wherein caulked portion (2c) is remained as a non-quenched portion having a surface hardness less than 24 HRC after its forging, and wherein the hoop stress generated within the inner ring (3) by plastic deformation of the end of the cylindrical portion (2b) is limited less than 300 MPa.

3. A method for manufacturing a bearing apparatus for a wheel of vehicle comprising an inner member (1) including a hub wheel (2, 21) having a wheel mounting flange (4) formed integrally therewith at one end thereof and a

cylindrical portion axially extending from the wheel mounting flange (4) , including an inner ring (3) fitted on the cylindrical portion (2b); an outer member (10) arranged around the inner member (1), and double row rolling elements (6, 6) contained freely rollably between the inner and outer members (1, 10), the inner ring (3) being secured in an axial direction relative to the hub wheel (2, 21) by a caulked portion (2c) formed by radially outwardly deforming the end of the cylindrical portion (2b) of the hub wheel (2, 21), characterized in that a chamfered outer circumferential surface (11) of the back side of the inner ring (3) is re-cut after its heat treatment.

4. A method for manufacturing a bearing apparatus for a wheel of vehicle of claim 3 wherein the chamfered outer circumferential surface (11) of the back side of the inner ring (3) is re-cut by cutting tool (14) of hardened steel after its heat treatment.

5. A method for manufacturing a bearing apparatus for a wheel of vehicle of claim 3 wherein the chamfered outer circumferential surface (11) of the back side of the inner ring (3) is re-cut by a grinding stone (20) at least simultaneously with an outer circumferential surface (17) of larger diameter end of the inner ring (3).

6. A method for manufacturing a bearing apparatus for a wheel of vehicle of claim 5 wherein the chamfered outer circumferential surface (11) of the back side of the inner ring (3) is re-cut by a grinding stone (20) at least simultaneously with a backside end face (16) of the front side and an inner raceway surface (51a) of the inner ring.